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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,215	10/30/2003	Xiaohui Hao	137954 (15114US01)	9776
23446 7590 10/05/2007 MCANDREWS HELD & MALLOY, LTD 500 WEST MADISON STREET SUITE 3400 CHICAGO, IL 60661			EXAMINER KHOLDEBARIN, IMAN K	
			ART UNIT 3737	PAPER NUMBER
			MAIL DATE 10/05/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/697,215

Applicant(s)

HAO ET AL.

Examiner

I Kenneth Kholdebarin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed March 07, 2007 have been fully considered but they are not persuasive.

2. After further consideration of the applicant's argument, examiner respectfully disagrees. In regards to applicant's remarks on page 7 and 8 in regards of claims 1 and 9 and their dependents, applicant argues that Chiao '869" as referenced in the background section of the present application, relates to use of a pair of Golay codes used in *two* data acquisitions rather than the single acquisition of the present application".

Examiner would like to further clarify that with respect of Chiao's (herein after REF A) teaching and in response to applications argument that REF A includes additional structure, Golay codes in pair, not required by Applicant's invention, it must be noted that REF A discloses the invention as claimed. The fact that it discloses additional structure, here Golay codes, not claimed is irrelevant.

Therefore, the examiner maintain previous rejection dated Dec 15, 2006 and repeated below, in addition claims 2-8, 10-13 are dependent of claim 1 and Claim 9 respectly.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 1, 2, 3, 7, 9, 10, 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Chiao '869. (US Patent 5,984,869)

Re Claim 1 and 2: Chiao discloses a coded excitation of ultrasound beams, encoding a first ultrasound beam (here one of the two sequences of pulses in disclosed reference) with a first code, transmitting first ultrasound beam on a first path (path that used for transmitting the pulses) encoding a second ultrasound beam (here the second sequences of pulses which is disclosed in reference) with a second code transmitting second ultrasound beam on a second path and receiving echo signals (received signal according to the reference) from first and second ultrasound beams, wherein first and second codes are Golay codes (See Fig.2, col. 2, line 58-67).

Re Claim 7: Chiao discloses the first and second ultrasound beams are encoded in first and second transmit focal zones and transmitted on said first path / direction and second path are

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equal (See Fig.3, col.2 line 35-37 and 25-30).

Re Claim 9 and 10: Chiao discloses a method for single transmission coded excitation where encoding a plurality of signals with a plurality of a complimentary codes and transmitting plurality of signals on a plurality of paths and processing echo (here Kronecker delta function) signals produced from plurality of signals (See Fig.3, Col. 7 line 10-26).

Re claim 11: Chiao discloses a method for filtering echo signals (See Col.5 line 25-45).

Claim 14-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Chiao '618 (US Patent 6,375,618).

Re Claim 14: Chiao '618 discloses a system for transmitting coded ultrasound signals wherein a waveform generator (24) for generating waveforms for a plurality of ultrasound signals and waveforms generator encodes waveforms for the plurality of ultrasounds signals; a transducer (10) for transmitting ultrasound beams based on said waveforms along a plurality of beam paths, transducer capable of receiving echo signals in response to ultrasound beams and decoder (52) for converting echo signals to image data (See fig. 2 and 8; Col. 8, line 45-50; Col. 4, line 19-21, Col 4, line 46-50).

Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claim 4, 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiao '869 in view of Philips (US patent 6,213,947). The teachings of Chiao '869 have been discussed above.

However, Chiao '869 fails to disclose or fairly suggest use of matched filtering on the echo signals,

Philips teaches the use of match filtering for most of the discussions related to both tissue harmonic imaging and contrast agent imaging within the art (See col.26 line 17-25).

Therefore, in view of Philips, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the match filter with the filter of Chiao in '869. Match filter could be used on echo signals in contrast agent imaging to have concentration on preferred embodiments of the received harmonic pulse(s) and further to apply the lateral filtering for averaging between the first and second transmit focal zone, in order to significantly reduce the signal to noise ratio of a beam in an ultrasound imaging method.

Claim 5, 6 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiao ('869).

The teaching of Chiao '869 has been discussed above.

Although Chiao '869 fails to disclose or fairly suggest use of lateral filtering on the echo signals, Chiao '869 teaches a method wherein finite impulse response (FIR) was applied for filtering (See Col.5 line 31-36), therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the method of averaging the echo signals and higher

order finite impulse response (FIR), by lateral filtering, in order to improve the method and apparatus of ultrasounds imagining wherein the signal to noise ration (SNR) is reduced.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to I Kenneth Kholdebarin whose telephone number is 571-270-1347. The examiner can normally be reached on M-F 8 AM- 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Iman Kenneth Kholdebarin/

09/28/2007


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